

Remarks

In the Office Action dated April 24, 2002, the Examiner rejected claims 1-32 under 35 U.S.C. § 112, second paragraph. The Examiner rejected claims 1, 2, 4, 5, 10, 12, 32 and 33 (sic) under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 4,787,086 to Dentai et al. (hereinafter Dentai), claims 1, 2-4, 6, 8, 10, 12, 14, 31 and 32 under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 6,263,002 to Hsu et al. (hereinafter Hsu), claims 1, 2, 4, 7, 10, 14, 16, 17 and 31 under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 4,637,025 to Snitzer et al. (hereinafter Snitzer), claims 1, 2, 6, 10 and 14 under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 4,358,851 to Scifres et al. (hereinafter Scifres), claims 5 and 7 under 35 U.S.C. § 103 as being unpatentable over Snitzer in view of U.S. Patent No. 6,288,835 to Nilsson, et al. (hereinafter Nilsson), and claims 9, 11, 13-15, 17, 18 and 22-25 under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,160,824 to Meissner, et al. (hereinafter Meissner) in view of U.S. Patent No. 5,504,762 to Hutchinson. The Examiner did not reject claims 19-21 and 26-30 based on prior art, alone or in combination.

By this Amendment, Applicant's attorney has amended Figure 1, claims 1, 3-5, 12, 16, 18, 25, 26, 31 and 32, canceled claims 10, 13 and 28-30, and added new claims 33-35. Figure 1 has been amended for consistency with the specification on page 3, ll. 17-20. Support for the amendment to claims 1 and 31 can be found, for example, on Figs. 6-12, and in the specification on page 12, ll. 14-20. Support for the amendment to claim 3 can be found, for example, on Figs. 9a-9d and 11a-11d, and in the specification on page 24, ll. 4-11. Support for the amendment to claim 4 can be found, for example, in the specification on page 13, ll. 19-30. Support for the amendment to claim 5 can be found, for example, in the specification on page 11, ll. 4-5. Support for the amendment to claim 12 can be found in now canceled claim 13. Support for the amendment to claim 16 can be found, for example, in the specification on page 10, ll. 14-21. Claims 18, 25, 26 and 32 have been amended for consistency. As such, no new matter has been added.

With respect to the Examiner's rejections, the Examiner is invited to consider the following remarks.

Applicant's attorney has amended claims 1, 3, 4, 5, 16, 18, 25, 26, 31 and 32 to obviate the 35 U.S.C. § 112, second paragraph rejections.

Independent claim 1 has been amended to provide a waveguide device having a plurality of sections arranged in series which acts as a planar waveguide in at least one direction of the device which comprises a non-circular core, and means for providing pump-light confinement and means for providing output mode control in different ones of the sections of the device along the direction of beam propagation. Independent claim 31 provides similar limitations. Clearly, these features are neither taught, disclosed nor discussed by the prior art cited by the Examiner, alone or in combination.

In particular, Dentai is directed to a single traverse mode laser where operation is achieved in an extended-cavity structure by combining a semiconductor gain medium having a large optical cavity together with a length of single mode optical fiber between first and second reflector surfaces. The first reflector surface is formed on an end facet of the semiconductor gain medium; the second reflector surface is formed on an end of the optical fiber. (Dentai, Abstract). Hsu is directed to fixed-wavelength and tunable fiber-optic lasers comprising a gain medium, for example a semiconductor, half-cavity VCSEL, or an organic light emitting polymer, within a Fabry-Perot cavity wherein one of the mirrors forming the cavity is a mirror integral with a fiber, for example a mirror (metallic or dielectric, for example) deposited at a fiber end, a reflective tap within an optical fiber, a fiber Bragg Grating (FBG), or a fiber loop mirror. (Hsu, Abstract).

Snitzer concerns a super-radiant light source having an output with a low temporal coherence which includes a single mode optical waveguide such as an optical fiber having its core doped with an active laser material, such as neodymium. Pump light is coupled into the optical fiber at an intensity sufficient to produce a significant amplification of the

spontaneous emission. The reflectivity at the exit end of the fiber is low enough so that even with a high gain for the light in one traverse through the fiber, the fiber is operated well below threshold for laser oscillation. (Snitzer, Abstract).

Scrifres is directed to a fiber optic device comprising an optical fiber/interference filter combination for wavelength selection or bandwidth selection from a multiwavelength light source or emitter. (Scrifres, Abstract). Nilsson is directed to single- or few-moded waveguiding cladding-pumped lasers, superfluorescent sources, and amplifiers, as well as lasers, including those for high-energy pulses, in which the interaction between the waveguided light and a gain medium is substantially reduced. (Nilsson, Abstract).

Meissner concerns a compound planar waveguide comprising multiple confinement structures that provides independent containment of pump and laser radiation. The waveguide may be formed of multiple layers of laser-active and laser-inactive materials to provide step changes in refractive index. The planar waveguide may include a central laserable core layer substantially sandwiched by at least two non-laserable cladding layers to provide an interface between the inner surfaces of the cladding layers and the gain medium core to define a first waveguide by virtue of an index of refraction discontinuity for containing developed laser radiation, and the outer surfaces of the cladding layers define a second waveguide by virtue of an index of refraction discontinuity for containing pump radiation within the waveguide. The second waveguide may be also defined by an interface formed between the cladding layers and additional non-laserable external layers which sandwich the cladding layers. The laser waveguide provides confinement of developed laser radiation which may be independently configured from the waveguide structure that confines the pump radiation. The planar waveguide layers may be also optically bonded together. (Meissner, Abstract).

Hutchinson is directed to a diode pumped laser system that includes a laser cavity with an active laser medium. A laser diode, with an emitter region having an output facet that produces light at a frequency λ_1 , is the pump source for the laser medium. A coupling optics is positioned on an emission path of radiation from the emitter region and is

optically coupled and spaced from the diode. The coupling optics produces stray radiation. An optical fiber, with a first end and a second end, is included. The first end of the fiber is oriented with respect to the coupling optics such that radiation from the emitter region is optically coupled into the optical fiber. The second end of the fiber is coupled to the laser cavity. (Hutchinson, Abstract).

Regarding the rejections of the claims which depend from claims 1 and 31, Applicant contends that these claims are patentable for at least the same reasons that claims 1 and 31 are patentable. Moreover, Applicant contends these claims recite further limitations, in addition to limitations of claims 1 and 31, which render these claims additionally patentable.

Consequently, in view of these remarks, Applicant respectfully contends that the rejection has been fully replied to and traversed, and that the application is in condition for allowance, which allowance is respectfully requested. A check in the amount of \$110 is enclosed to cover the Petition fee of \$110 for a one month extension of time. Please charge any additional fees or credit any overpayments as a result of the filing of this paper to our Deposit Account No. 02-3978 -- a duplicate of this paper is enclosed for that purpose.

The Examiner is requested to telephone the undersigned to discuss prompt resolution of any remaining issues necessary to place this case in condition for allowance.

Respectfully submitted,

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Attachment: Replacement Sheet
Annotated Sheet Showing Changes

Amendments to the Drawings:

The attached sheet of drawings includes changes to Fig. 1. This sheet, which includes Figs. 1-3, replaces the original sheet including Figs. 1-3.

Attachment: Replacement Sheet

Annotated Sheet Showing Changes